

PGH-7 Notes and Citations

Food Insecurity

We used a two-item food insecurity screener (Hager, Quigg, Black, et al., 2010), which was developed from the 18-item U.S. Household Food Security Survey (Nord, Andrews, Carlson, 2007). The screener is scored as positive if either of the two questions, both with 12-month recall periods, are affirmatively endorsed (often true or sometimes true); we worried whether our food would run out OR the food we bought just didn't last (Hager, et al., 2010). Children living in food-insecure families report poorer health (Cutts, Meyers, Black, et al., 2011; Hager, et al., 2010) and more hospitalizations (Hager, et al., 2010) than their counterparts.

Cutts DB, Meyers AF, Black MM, et al. U.S. Housing insecurity and the health of very young children. *Am J Public Health* 2011; 101(8):1508–14.

Hager ER, Quigg AM, Black MM, et al. Development and validity of a 2-item screen to identify families at risk for food insecurity. *Pediatrics* 2010; 126(1):e26–32.

Nord M, Andrews M, Carlson S. Household food security in the United States, 2007. Economic Research Report No. 66. Washington, DC: U.S. Department of Agriculture, Economic Research Service; 2008. Available at https://www.ers.usda.gov/webdocs/publications/46084/13819_err66fm_1_.pdf?v=0. Accessed October 9, 2018.

Housing Insecurity

Housing insecurity was assessed with a single item based on work by Kushel and colleagues who found that self-reported problems paying rent, mortgage, or utility bills in the past year was associated with lack of access to primary care, poorer medication adherence, more use of the emergency department, and increased risk for hospitalization (Kushel, Gupta, Gee, et al., 2006).

Kushel MB, Gupta R, Gee L, et al. Housing instability and food insecurity as barriers to health care among low-income Americans. *J Gen Intern Med* 2006; 21(1):71–7.

Asthma Control Test

The asthma control test (ACT) is a self-administered questionnaire for patients 12 years of age and older. There are five items, each with a 4-week recall period; the items measure shortness of breath, nighttime awakenings, limitations of daily activities, rescue medication use, and rating of asthma control (Nathan, Sorkness, Kosinski, et al., 2004). Items are scored from 1 to 5 (range 5–25); higher scores indicate better asthma control. The ACT correlates well with specialists' ratings of asthma control and spirometry (Lenoir, Williamson, Stanford, et al., 2006; Nathan, et al., 2004; Schatz, Sorkness, Li, et al., 2006). A score of 15 or less corresponds to very poorly controlled asthma, 16–19 uncontrolled asthma, and 20 or higher well-controlled asthma (Nathan 2004; Schatz, et al., 2006; Schatz, Mosen, Kosinski, et al., 2007). From a study that contrasted the ACT with a measure of asthma-related quality of life, the minimal important difference among adolescents was estimated to be 2 points (Voorend-van Bergen, Vaessen-Verberne, Landstra, et al., 2013).

Lenoir M, Williamson A, Stanford RH, et al. Assessment of asthma control in a general population of asthmatics. *Curr Med Res Opin* 2006; 22(1):17–22.

Nathan RA, Sorkness CA, Kosinski M, et al. Development of the asthma control test: A survey for assessing asthma control. *J Allergy Clin Immunol* 2004; 113(1):59–65.

Schatz M, Mosen DM, Kosinski M, et al. Validity of the Asthma Control Test completed at home. *Am J Manag Care* 2007; 13(12):661–7.

Schatz M, Sorkness CA, Li JT, et al. Asthma Control Test: Reliability, validity, and responsiveness in patients not previously followed by asthma specialists. *J Allergy Clin Immunol* 2006; 117(3):549–56.

Voorend-van Bergen S, Vaessen-Verberne AA, Landstra AM, et al. Monitoring childhood asthma: Web-based diaries and the Asthma Control Test. *J Allergy Clin Immunol* 2014; 133(6):1599–605.e2.

Childhood Asthma Control Test

The Childhood Asthma Control Test (C-ACT) was used for children ages 5-11 years. It is a seven-item scale that includes four child-report and three parent-report items (Liu, Zeiger, Sorkness, et al., 2007). Child-report items (scored 0-3) have no recall period and address overall assessments of asthma control, interference with exercise, cough, and nighttime awakenings, while parent-report items (scored 0 to 5) use a 4-week recall period and cover daytime asthma symptoms, wheezing, and nighttime awakenings (Liu, et al., 2007). The range of the measure is 0 (poorest asthma control) to 27 (best asthma control). Scores of 0-12 indicate very poorly controlled asthma (Liu, Zeiger, Sorkness, et al., 2010), 13-19 poorly controlled asthma (Liu, et al., 2007; 2010), and scores 20-24 well-controlled asthma (Liu, et al., 2007; Voorend-van Bergen, Vaessen-Verberne, Landstra, et al., 2013). From a study that contrasted the C-ACT with a measure of asthma health-related quality of life, the minimal important difference among adolescents was estimated to be 2 points (Voorend-van Bergen, 2014).

Liu AH, Zeiger R, Sorkness C, et al. Development and cross-sectional validation of the Childhood Asthma Control Test. *J Allergy Clin Immunol* 2007; 119(4):817–25.

Liu AH, Zeiger RS, Sorkness CA, et al. The Childhood Asthma Control Test: Retrospective determination and clinical validation of a cut point to identify children with very poorly controlled asthma. *J Allergy Clin Immunol* 2010; 126(2):267–73–273.e1.

Voorend-van Bergen S, Vaessen-Verberne AA, Landstra AM, et al. Monitoring childhood asthma: Web-based diaries and the asthma control test. *J Allergy Clin Immunol* 2014; 133(6):1599–605.e2.

Asthma Severity

During the baseline visit in the emergency department and at primary care follow-up visits, clinicians assessed the patient's asthma severity (NHLBI 2007) and recorded this in the electronic health record (EHR).

National Heart, Lung, and Blood Institute. Expert Panel Report 3 (EPR-3): Guidelines for the Diagnosis and Management of Asthma - Summary Report, 2007. Available at <https://www.nhlbi.nih.gov/files/docs/guidelines/asthgdln.pdf>. Accessed October 9, 2018.

PROMIS Pediatric Asthma Impact Scale

PROMIS Pediatric Asthma Impact Scoring Manual. Available at <https://www.assessmentcenter.net/documents/PROMIS%20Asthma%20Impact%20Scoring%20Manual.pdf>. Accessed October 9, 2018.

Yeatts KB, Stucky B, Thissen D, et al. Construction of the Pediatric Asthma Impact Scale (PAIS) for the Patient-Reported Outcomes Measurement Information System (PROMIS). *J Asthma* 2010; 47(3):295–302.

PROMIS Pediatric Psychological Stress Scale

Bevans KB, Gardner W, Pajer K, et al. Qualitative development of the PROMIS(R) pediatric stress response item banks. *J Pediatr Psychol* 2013; 38(2):173–91.

PROMIS Pediatric Physical Activity Scale

Tucker CA, Bevans KB, Teneralli RE, et al. Self-reported Pediatric Measures of Physical Activity, Sedentary Behavior, and Strength Impact for PROMIS: Conceptual Framework. *Pediatr Phys Ther* 2014; 26(4):376–84.

Tucker CA, Bevans KB, Teneralli RE, et al. Self-reported Pediatric Measures of Physical Activity, Sedentary Behavior, and Strength Impact for PROMIS: Item Development. *Pediatr Phys Ther* 2014; 26(4):385–92. doi:10.1097/PEP.0000000000000074.

Healthy Pathways Student Engagement and Academic Performance Scales

The student engagement and academic performance scales were developed and psychometrically evaluated as part of Project Healthy Pathways, a longitudinal study of the associations between children's health and school performance (Forrest, Bevans, Riley, 2013). Student engagement declines with advancing grade in school and pubertal development, while it is positively associated with feelings of comfort and subjective well-being (Forrest, et al., 2013).

Parents rate their child's academic performance lower than the children rate themselves, with an intraclass correlation coefficient of agreement of 0.56 (Bevans, Riley, Forrest, 2012).

Bevans KB, Riley AW, Forrest CB. Development of the Healthy Pathways Parent-Report Scales. *Qual Life Res* 2012; 21(10):1755–70.

Forrest CB, Bevans KB, Riley AW, et al. Health and School Outcomes During Children's Transition into Adolescence. *J Adolesc Health* 2013; 52(2):186–94.

PROMIS Pediatric Global Health Scale (PGH-7)

The PROMIS Pediatric Global Health Scale measures a person's overall health across physical, mental, and social dimensions (Forrest, Bevans, Pratiwadi, et al., 2014). It is based on the same conceptual framework as its adult counterpart (Hayes, Bjorner, Revicki, et al., 2009). Children with asthma report global health that is 0.56 standard deviation units lower than the general population (Forrest, Tucker, Ravens-Sieberer, et al., 2016).

Forrest CB, Bevans KB, Pratiwadi R, et al. Development of the PROMIS® pediatric global health (PGH-7) measure. *Qual Life Res* 2014; 23(4):1221–31.

Hays RD, Bjorner JB, Revicki DA, et al. Development of physical and mental health summary scores from the patient-reported outcomes measurement information system (PROMIS) global items. *Qual Life Res* 2009; 18(7):873–80.

Forrest CB, Tucker CA, Ravens-Sieberer U, et al. Concurrent validity of the PROMIS® pediatric global health measure. *Qual Life Res* 2016; 25(3):739-51.

Change in Global Health Scale

One of our objectives was to determine the numerical change in PGH-7 score associated with a perceptible change in global health as rated by the child or the parent using an independent measure. We therefore modified the subjective significance questionnaire developed by Osoba and colleagues (Osoba, Rodrigues, Myles, et al., 1998). During the first follow-up wave, children and their parents were asked if their “health in general is better, the same, or worse” since they enrolled in the study. Those responding “better” were then asked if it was a little better, somewhat better, or a lot better, and those responding “worse” were asked if their health was a little, somewhat, or a lot worse. The same questions were used in the third wave, but the first question was indexed to their completion of “the second survey.”

Osoba D, Rodrigues G, Myles J, et al. Interpreting the significance of changes in health-related quality-of-life scores. *J Clin Oncol* 1998; 16(1):139–44.